


**Important**

This Technical Data Sheet and the corresponding Installation Instructions provide important information to ensure the installed engine will operate according to the design specification in the Volvo Penta application for certification.

Requirements marked with  are considered as critical for exhaust emissions compliance according to the design specification in the Volvo Penta application for certification.

Failing to follow and meet these instructions and requirements when installing a certified engine in a piece of nonroad equipment for use in the United States violates U.S. federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act.

**General**

In-line four stroke diesel engine with direct injection. Rotation direction, anti-clockwise viewed towards flywheel

Number of cylinders			4
Displacement, total		liters	5,13
		in <sup>3</sup>	313
Firing order			1-3-4-2
Bore		mm	110
		in	4,33
Stroke		mm	135
		in	5,31
Compression ratio			17.5:1
Wet weight (Not including after treatment system)	Engine only	kg	583
		lb	1285
	Power pac	kg	877
		lb	1933
	Power pac, compact cooling package	kg	802
		lb	1768

**Performance**

				rpm	1500	1800	2000	2300
IFN Power	160 kW	without fan	kW	141	160	160	160	
			hp	192	218	218	218	
		with fan 600 mm pull	kW	136	153	153	153	
			hp	185	208	208	208	
Torque at:	IFN Power 160 kW		Nm	900	849	764	665	
			lbf ft	664	626	563	490	
Max torque at engine speed	IFN Power	1450 rpm	Nm	910				
			lbf ft	671				
Power tolerance			%	±3				
Mean piston speed			m/s	6,8	8,1	9,0	10,4	
			ft/sec	22,1	26,6	29,5	34,0	
Effective mean pressure at:	IFN Power 160 kW		MPa	2,20	2,08	1,87	1,63	
			psi	319	301	271	236	
Total mass moment of inertia, J (mR <sup>2</sup> ) (not including flywheel)			kgm <sup>2</sup>	0,253				
			lbft <sup>2</sup>	6,0				
Friction Power			kW	12	16	20	26	
			hp	16	22	27	35	

**Derating see Technical Diagrams**

**Cold start performance**

*Cold start limit temperature	without starting aid	°C	-15	
		°F	5	
	with manifold heater 4 kW	°C	-30	
		°F	-22	
	with manifold heater 4 kW and block heater	°C	-35	
		°F	-31	
*Specify oil quality	Above -15°C; 15W40 Above -25°C; 10W30 Below -25°C; 5W30			
Block heater type	Make	Power kW	Engaged hours	Cooling water temp engine block
	Volvo	1,5		

\* See also general section in the sales guide

**Lubrication system**

Lubricating oil consumption (average)		Vol%	0,05
Oil system capacity including filters		liter	16
		US gal	4,23
Oil pan capacity:	Max	liter	13,5
		US gal	3,57
	Min	liter	9,5
		US gal	2,51
Oil change intervals/specifications	VDS4, VDS4.5	h	500
		h	
Engine angularity limits:	front up	°	40
	front down	°	45
	side tilt	°	40
Oil pressure at rated power		kPa	425
		psi	62




**Lubrication system**

Lubrication oil temperature in sump:	max	°C	125
		°F	257
Oil filtration efficiency (in accordance with ISO 4548-12)	97%	μ	36
	50%	μ	14

### Fuel system

Urea consumption (vol% of diesel consumption)	vol%	7%
Fuel to conform to		EU EN590 US D975, 1-D and 2-D (Max 15ppm sulphur and 7% FAME)
System supply flow at max. speed	liter/h US gal/h	102 26,9
Fuel supply line max. restriction (Measured at fuel inlet connection)	kPa psi	25 3,6
Fuel supply line max. pressure, during engine stand still (measured at fuel inlet connection)	kPa psi	20 2,9
System return flow at max. speed	liter/h US gal/h	60,0 15,9
Fuel return line max. restriction (Measured at fuel return connection)	kPa psi	15 2,2
Max. allowable inlet fuel temp (Measured at fuel inlet connection)	°C °F	80 176
Prefilter / Water separator filtration efficiency	99%	μ 30
Main fuel filter filtration efficiency (in accordance with ISO 19438)	98%	μ 5
	96%	μ 4
Governor type/make, standard		Volvo/ EMS 2.3
Injection pump type/make		Denso HP3

### Intake and exhaust system

		Inlet air temp	rpm	1500	1800	2000	2300
Charge air consumption at: (+25°C and 100kPa)	IFN Power 160 kW	25°C	m³/min	8,7	10,0	10,8	11,5
		77°F	cfm	307	353	381	406
 <b>See front page for important information</b>							
Max allowable air intake restriction including piping			kPa psi	6 0,9			
Heat rejection to exhaust at:	IFN Power 160 kW		kW BTU/min	88 4982	106 6011	104,9 5966	112,3 6386
Exhaust gas temperature after turbine at:	IFN Power 160 kW		°C °F	468 874	489 912	455 851	457 855
 <b>See front page for important information</b>							
Max allowable back pressure in exhaust line (after turbine) Pipe dimension Ø: 102 mm			kPa psi	13 1,9	15 2,2	16 2,3	18 2,6
 <b>See front page for important information</b>							
Max allowable temperature drop between turbine and SCR muffler inlet (in average over a customer cycle (not stationary points)).			Δ°C Δ°F	15 27			
SCR muffler pressure drop (at exhaust gas flow and exhaust temp given)			kPa psi	7 1,0	8 1,2	9 1,3	10 1,5
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	IFN Power 160 kW		m³/min	20,7	24,0	24,5	25,7
			cfm	731	848	865	908

**VOLVO PENTA**

TAD572VE 160kW/2300rpm



Document No

**22370692**

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<b>Cooling system</b>		<b>rpm</b>	<b>1500</b>	<b>1800</b>	<b>2000</b>	<b>2300</b>
Heat rejection radiation from engine at:	IFN Power 160 kW	kW	9	10	8	8
		BTU/min	500	546	455	455
Heat rejection to coolant at:	IFN Power 160 kW	kW	75	89	89,7	95,6
		BTU/min	4265	5050	5101	5437
Radiator cooling system type			Closed circuit			
Standard radiator core area	IFN Power 160 kW	m <sup>2</sup>	0,6			
		foot <sup>2</sup>	6,46			
Compact cooling package radiator core area	IFN Power 160 kW	m <sup>2</sup>	0,28			
		foot <sup>2</sup>	3,01			
Fan diameter	600 mm	IFN Power 160 kW	600			
			23,62			
Maximum fan power consumption	600 mm pull	kW	5,1	7,2	7,2	7,2
		hp	7	10	10	10
Fan drive ratio	fan Ø600		1:1.4			
	fan position high		1:1.1			
Coolant capacity:	engine	liter	13			
		US gal	3,4			
	engine + standard radiator with hoses and expansion tank	liter	47			
		US gal	12,4			
engine + compact cooling package radiator with hoses and expansion tank	liter	31				
	US gal	8,2				
Coolant pump		drive/ratio	belt/1,40:1			
Coolant flow with standard system		l/s	5,4	6,5	7,2	8,2
		US gal/s	1,4	1,7	1,9	2,2
Minimum coolant flow		l/s				4,5
		US gal/s				1,2
Maximum outer circuit restriction incl. piping		kPa	40,0			
		psi	5,8			
Thermostat:	start to open	°C	85			
		°F	185			
	fully open	°C	95			
		°F	203			
Maximum static pressure head (expansion tank height + pressure cap setting)		kPa	110			
		psi	16,0			
Minimum static pressure head (expansion tank height + pressure cap setting)		kPa	85			
		psi	12,3			
Standard pressure cap setting		kPa	100			
		psi	14,5			
Maximum top tank temperature		°C	107			
		°F	225			
Recommended Draw down capacity. The difference between min coolant level in the expansion tank and the lowest level where the engine's coolant system still are functioning		liter	2			
		US gal	0,5			

Charge air cooler system		rpm	1500	1800	2000	2300
Heat rejection to charge air cooler	IFN Power 160 kW	kW	22,6	26,7	26,2	27,5
		BTU/min	1285	1518	1490	1564
Charge air mass flow	IFN Power 160 kW	kg/s	0,17	0,195	0,211	0,225
Charge air inlet temp. (Charge air temp after turbo compressor)	IFN Power 160 kW	°C	182	186	174	174
		°F	360	367	345	345
 <b>See front page for important information</b> Max allowable Charge air outlet temp. (Charge air temp after charge air cooler)		°C	48	50	50	50
		°F	118	122	122	122
 <b>See front page for important information</b> Maximum pressure drop over charge air cooler incl. piping		kPa	8	9	12	12
		psi	1,16	1,31	1,74	1,74
Charge air pressure (relative) (After charge air cooler)		kPa	206	214	185	170
		psi	29,88	31,04	26,83	24,66
Standard charge air cooler core area		m <sup>2</sup>	0,5			
		foot <sup>2</sup>	5,38			
Compact charge air cooler core area		m <sup>2</sup>	0,22			
		foot <sup>2</sup>	2,37			

### Cooling performance: 0,6 m<sup>2</sup> radiator and 600mm fan, pull

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 107°C TTT and std coolant. Valid at 1 atm.

Engine speed	Engine power	Air on temp		IFN Power 160 kW			
				Air flow		External restriction	
				°C	°F	m <sup>3</sup> /s	ft <sup>3</sup> /s
1500	141 192	74	165	6	211,9	0	
		73	163	5,7	201,3	100	0,015
		72	161	5,5	194,2	200	0,029
		69	155	4,9	173,0	300	0,044
2300	160 218	72	162	7,6	268,4	0	
		72	161	7,4	261,3	100	0,015
		71	160	7,2	254,3	200	0,029
		71	159	7,1	250,7	300	0,044

### Cooling performance: 0,28 m<sup>2</sup> radiator and 600mm fan, pull

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 107°C TTT and 40% coolant. Valid at 1 atm.

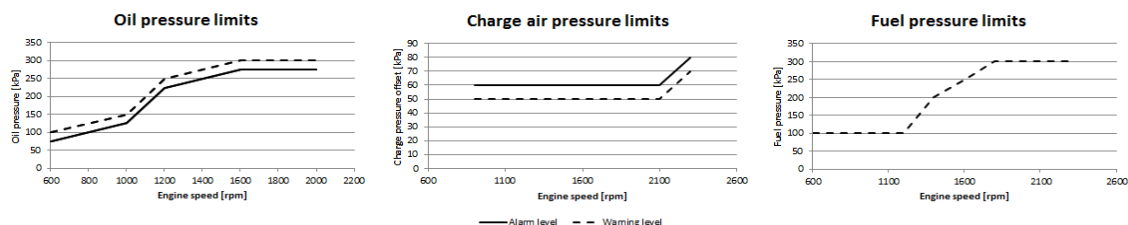
Engine speed	Engine power	Air on temp		IFN Power 160 kW			
				Air flow		External restriction	
				°C	°F	m <sup>3</sup> /s	ft <sup>3</sup> /s
1500	141 192	51	123	5,9	208,4	0	
		49	120	5,7	201,3	100	0,015
		46	115	5,4	190,7	200	0,029
		40	103	4,8	169,5	300	0,044
2300	160 218	54	130	7,0	247,2	0	
		54	128	6,9	243,7	100	0,015
		52	125	6,6	233,1	200	0,029
		50	121	6,2	219,0	300	0,044

### Engine management system

Functionality	Alternatives			Default setting
Governor mode	Droop	Isochronous		Isochronous
Governor droop	10	125	Nm/rpm	
Governor response	Adjustable PI constants			
Idle speed	600	900	rpm	700
Stop function				Replaced by "Ignition of stop engine"
Preheating function	Ignition	Request	Request + temp	If preheat is available, preheat will be active at ignition on if temp low or demanded by driver.
Lamp test				No lamp test, not used any longer
Ignition of stop engine	Yes	No		No

Engine sensors and switch settings		Alarm level	Default setting	Engine protection	
Parameter	Unit	Setting range	Default setting	Level	Action. Default/Alternative
Oil temp	°C		125	125	Derate/Shut down
Oil pressure	Low idle	kPa	75,0	75	Shut down.
	Rated speed	kPa	275	275	Shut down.
Oil level			Low level		
Coolant temp	°C		107	107	Derate/Shut down
Coolant level		See cooling system	On	Low level	Derate/Shut down
Fuel feed pressure	Low idle	kPa	100		
	Rated speed		300		
Water in fuel			Alarm when closed		
EGR temp	°C		210	210	Derate/Shut down
Air filter pressure drop			5kPa		
Altitude, above sea	m			700	Automatic derating, see section derating
Charge air temp	°C		120	120	Derate/Shut down
Charge air pressure	kPa		Alarm map value	Alarm map value	Derate/Shut down
SCR temp	°C		515	515	Derate

Parameter	Warning	Alarm	Derated 0% to engine protection map	Derated 100% to engine protection map	Forced idle after 5 sec	Forced shut down after 0 sec
Coolant temp	102°C	107°C	107°C	112°C		
Oil temp	120°C	125°C	125°C	130°C		
Low oil pressure	Warning map value	Alarm map value				Alarm map value
High charge air temp	115°C	120°C	120°C	140°C		
High charge air pressure	Warning map value	Alarm map value		Alarm map value		
EGR temp	200°C	210°C	210°C	220°C		



**Electrical system**

Voltage and type			24V
Alternator:	make		MELCO
	output	A	110/130
	tacho output	Hz/alternator rev.	
	drive ratio		
Starter motor:	make		MELCO
	type		<b>85P50/90P55</b>
	output	kW hp	5 / 5.5 6.8 / 7.5
Number of teeth on:	flywheel		137
	starter motor		10 / 12 teeth
Inlet manifold heater (at 20 V)		kW	4
Power relay for the manifold heater		A	200

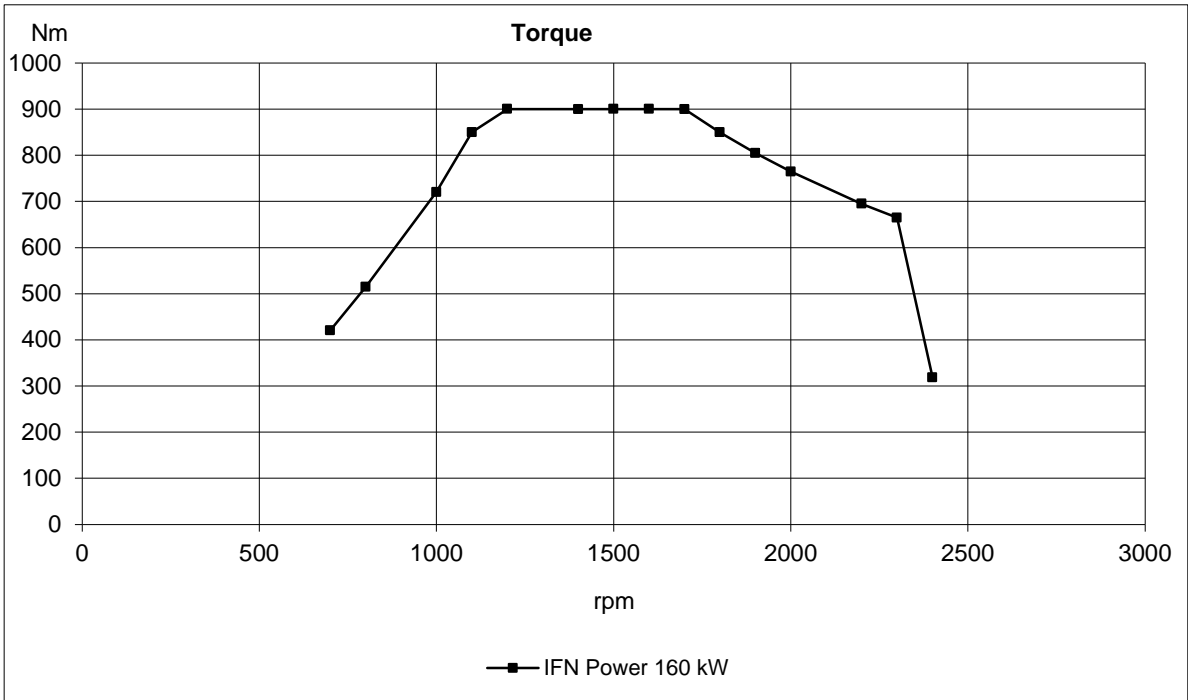
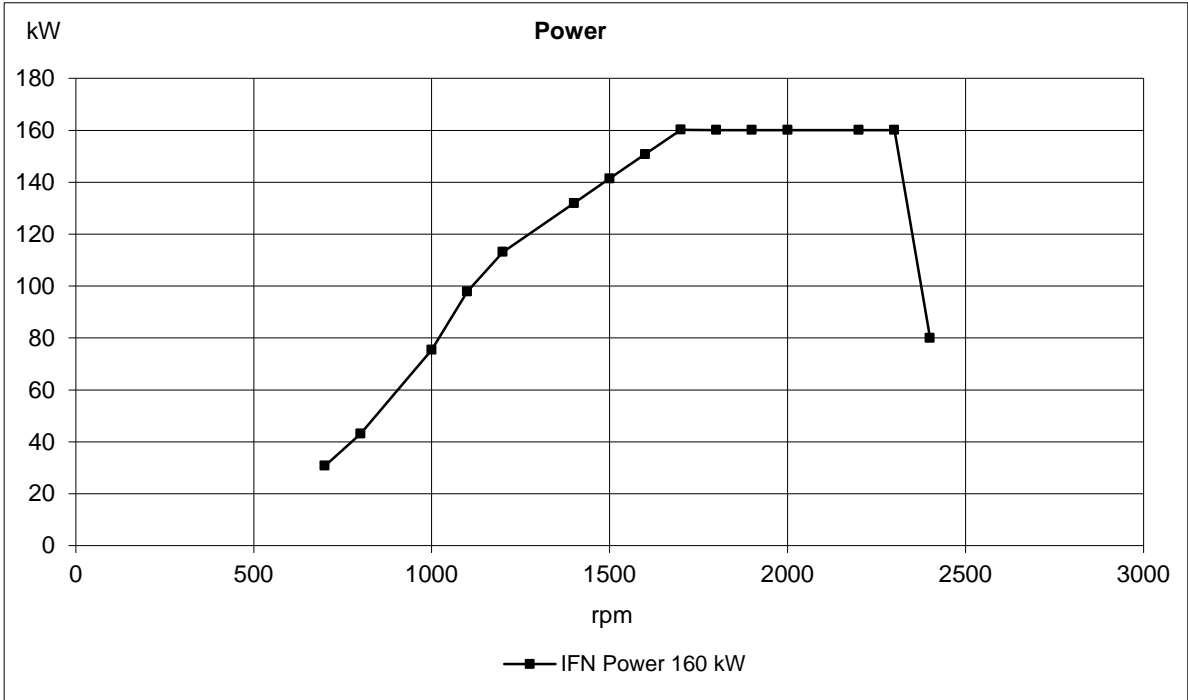
Conditions: (5 mΩ main circuit resistance@ 20°C)	Temperature	°C	25	0	-15
	Battery	Ah / CCA	100/700	100/700	100/700
Crank speed		rpm	197	150	123
Crank current		A	173	265	320
Starter input power during crank		kW	3,90	4,70	5,20
Battery power during crank		kW	4,00	5,10	5,70
Min battery @ 0°C		Ah / CCA	100/700		

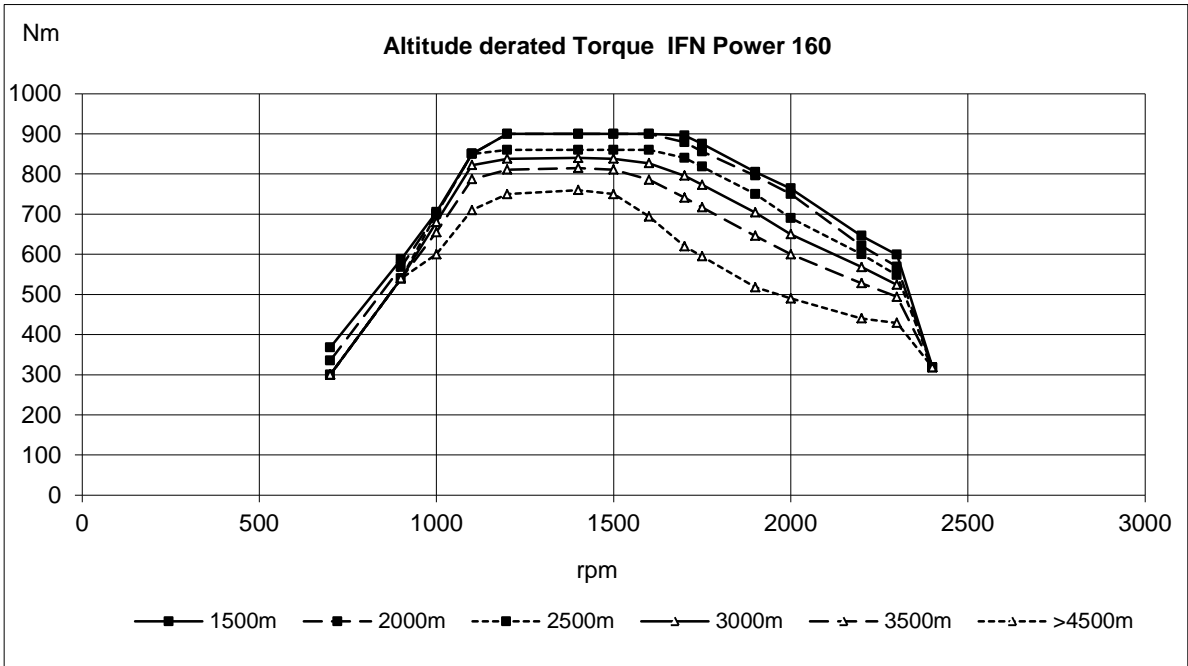
**Power take off**

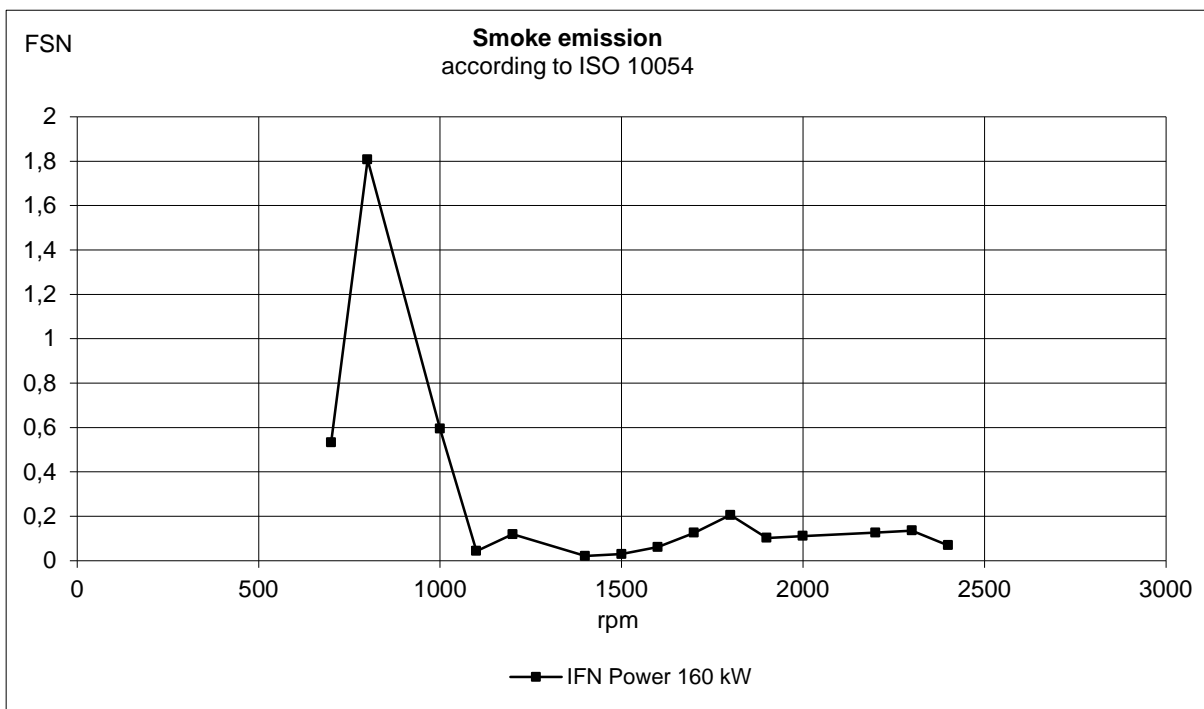
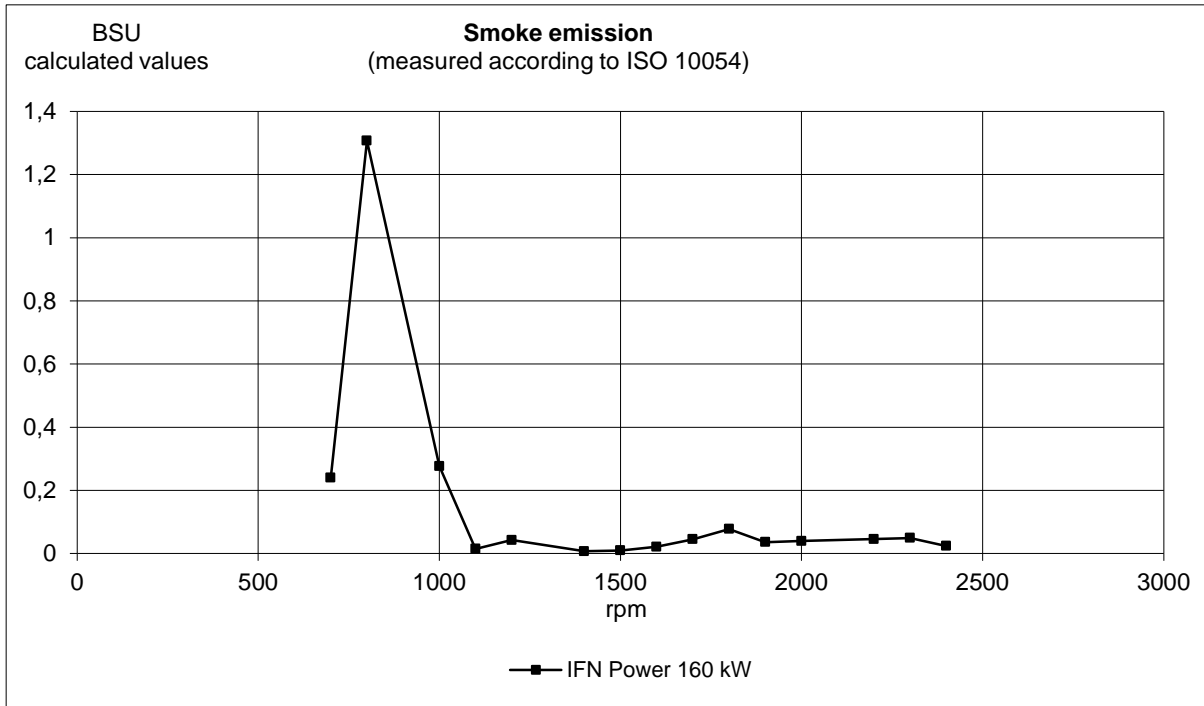
		rpm	1400	1800	2000	2300	
Front end in line with crank shaft max:*	0.02 kgm <sup>2</sup>	Nm lbf ft	866 639	817 603	750 553	610 450	
	SAE 2, STD 10" & 11,5 ", 1.303 kgm <sup>2</sup>	0.03 kgm <sup>2</sup>	Nm lbf ft	866 639	748 552	711 524	457 337
		0.04 kgm <sup>2</sup>	Nm lbf ft	866 639	695 513	645 476	399 294
Front end belt pulley load.	Max up (above or equal to horizontal line)	kW hp	3,4 4,6	4,1 5,6	4,5 6,1	5,2 7,1	
	Max down (below horizontal line)	kW hp	28,4 38,6	34,0 46,2	37,8 51,4	43,5 59,2	
Maximum power on Rear PTO on top of flywheel housing(REPTO):*		kW hp	75 102				
Speed ratio direction of rotation viewed from flywheel side			1:1 Counter clockwise				
Maximum torque on PTO at compressor position:*		Nm lbf ft	200 148				
Speed ratio direction of rotation viewed from flywheel side			1.026:1 Counter clockwise				
Timing gear at hydraulic pump PTO max:*		Nm lbf ft	80 59				
Speed ratio direction of rotation viewed from flywheel side			1.3:1 Clockwise				
Max allowed bending moment in flywheel housing SAE2		Nm lbf ft	4600 3393				
Max. rear main bearing load		N lbf	5000 1124,0				

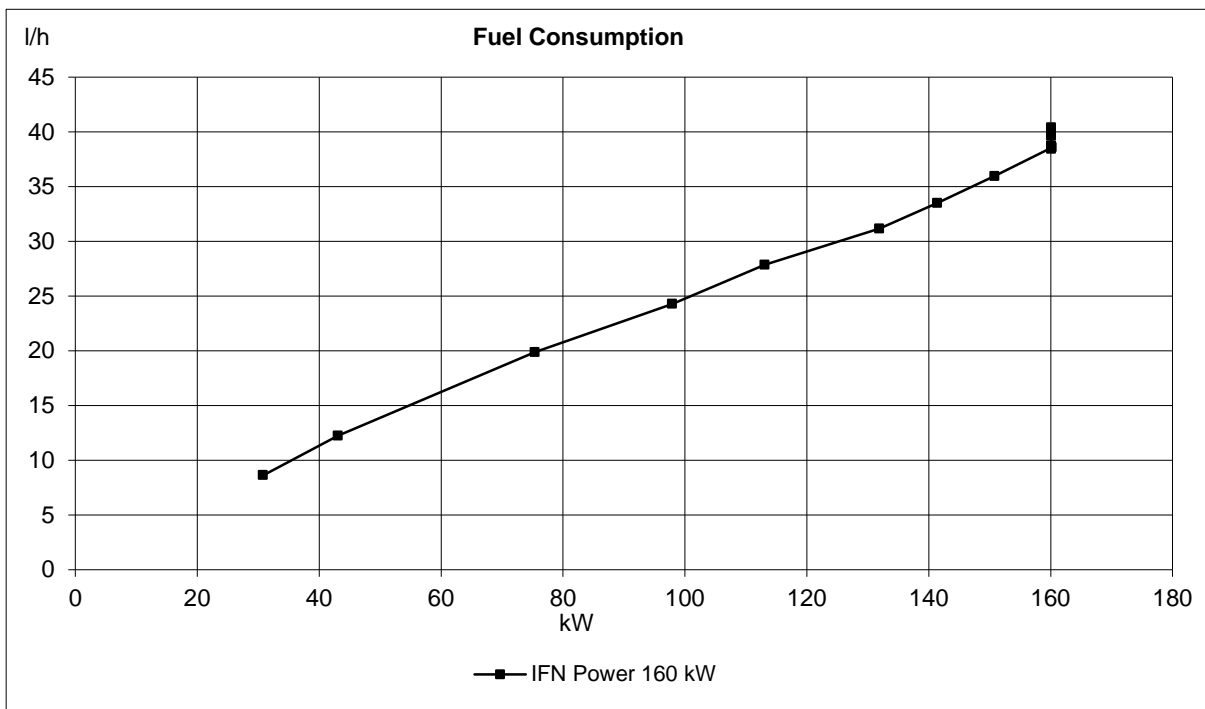
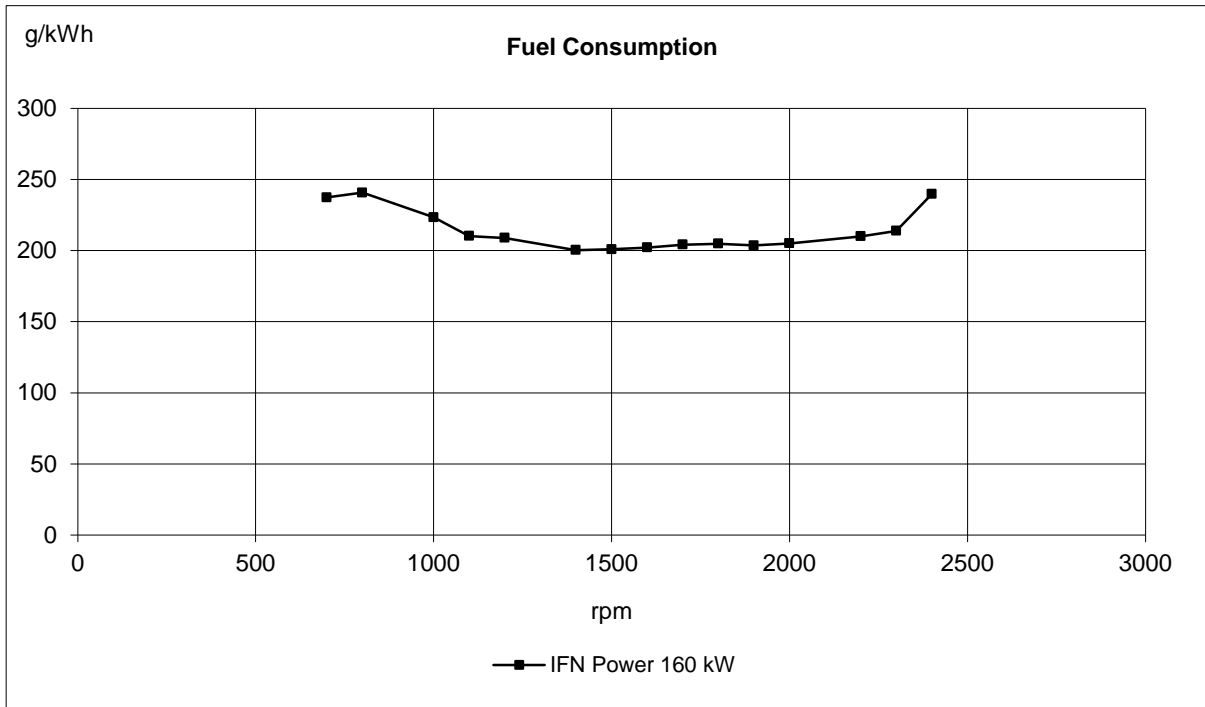
\* Maximum allowed torque at individual PTO's.

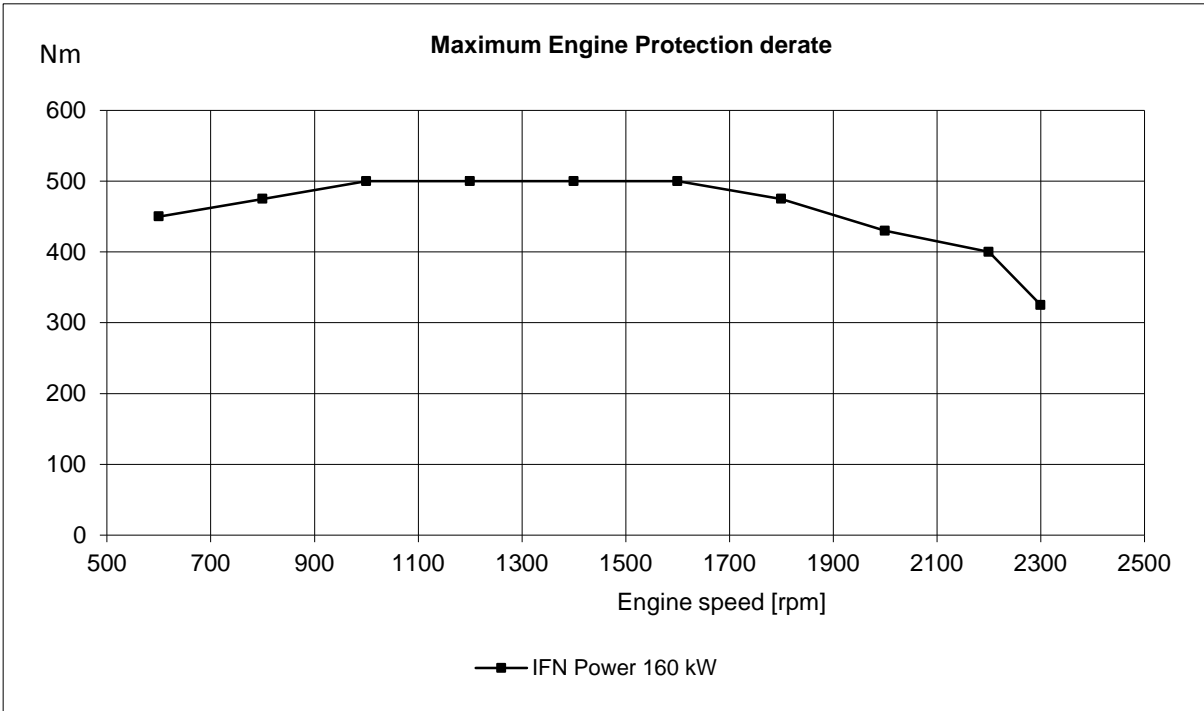
If more then one PTO output is used simultaniously, calculations needs to be performed to determine available maximum. Available torque depends on application inertia.

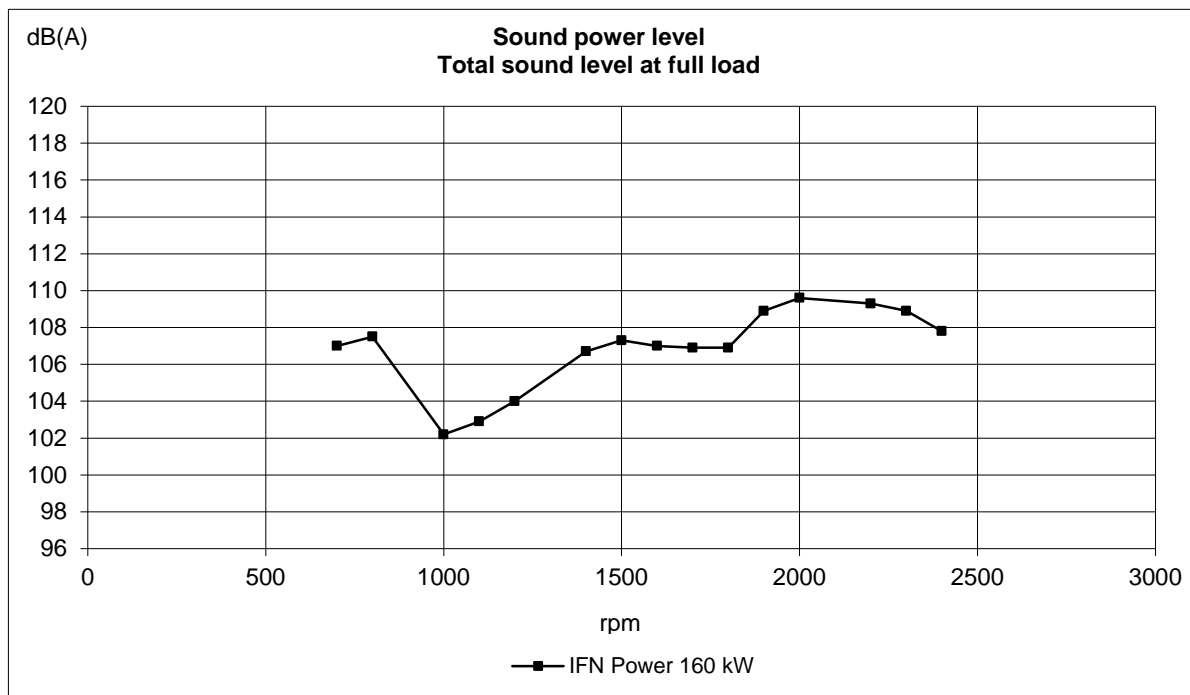
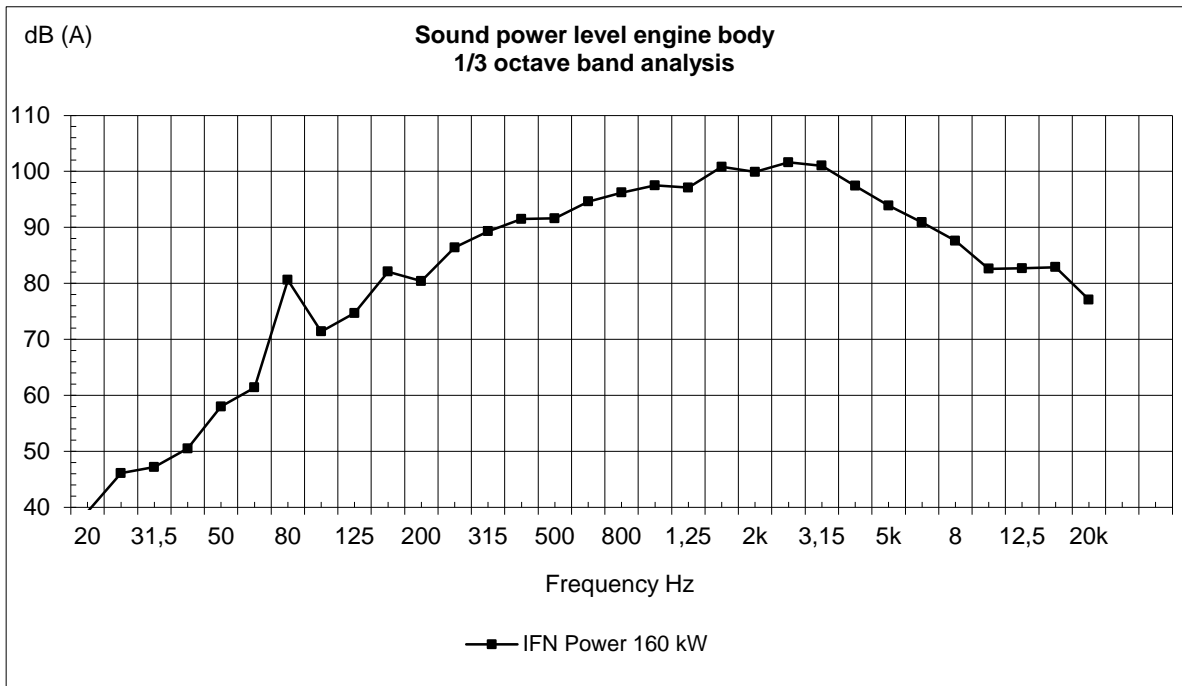


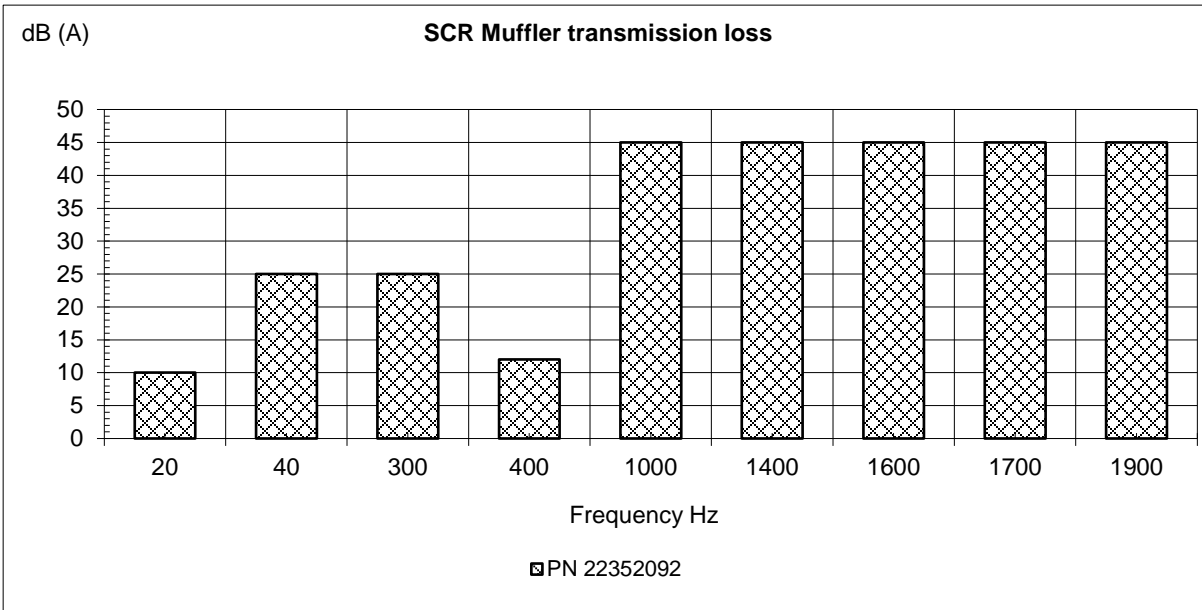


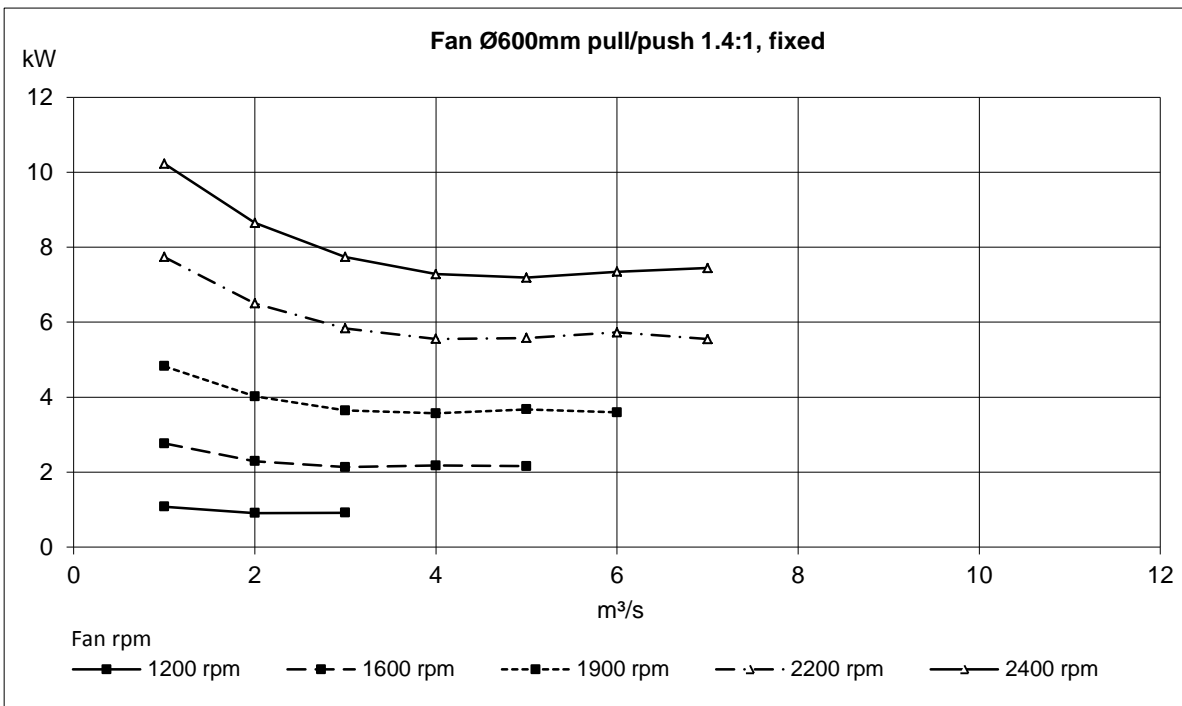




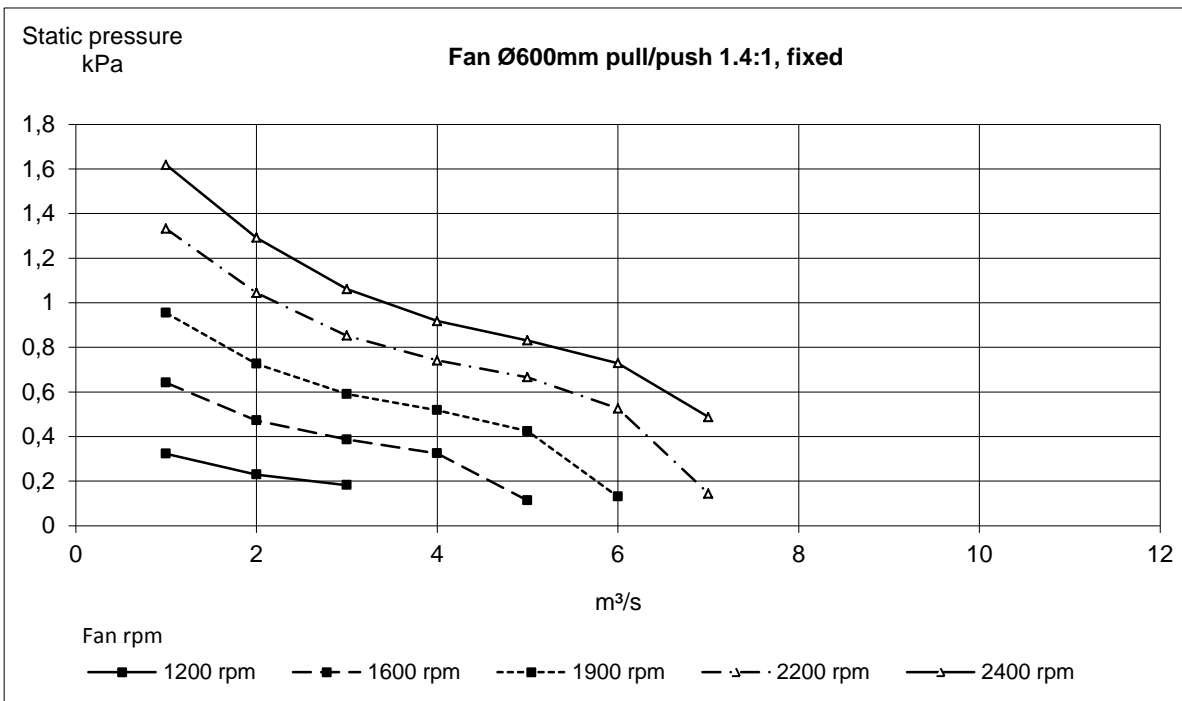








Maximum fan speed with visco clutch: 2400rpm



Maximum fan speed with visco clutch: 2400rpm

